

What is claimed is:

1. An image processing system comprising:

correction means for correcting image signals to adjust a distortion of an image;

5 image projection means for projecting an image based on the image signals;

sensing means for sensing the projected image to generate sensing information;

brightness-index-value-distribution analyzing means for partitioning the sensed  
projected image by predetermined image processing units based on the sensing  
information, detecting a portion of the sensed projected image that includes a image  
10 processing unit having a maximum brightness index value among all of the image  
processing units as a peak position or detecting part of a portion of the sensed projected  
image in which the image processing units adjacent to one another have the same  
brightness index values, and generating coordinate information which indicates the peak  
position; and

15 correction-amount derivation means for determining the distortion in the  
projected image based on the coordinate information, and deriving an amount of  
correction for the correction means according to a state of the distortion in the projected  
image,

20 wherein the correction means corrects the image signals based on the amount of  
correction.

2. The image processing system as claimed in claim 1,

wherein the image processing units include vertical pixels and horizontal pixels,  
the vertical pixels being pixels arranged in a vertical direction in the sensed projected  
25 image and the horizontal pixels being pixels arranged in a horizontal direction in the  
sensed projected image, and

wherein the brightness-index-value-distribution analyzing means computes an

accumulated brightness index value for each of groups of the vertical pixels and compares the accumulated brightness index value in each of the groups of the vertical pixels adjacent to one another in the horizontal direction, determines a horizontal coordinate position of the peak position based on a pixel position of a portion of the sensed projected image in which the groups of the vertical pixels adjacent one another in the horizontal direction have the same accumulated brightness index value, computes an accumulated brightness index value for each of groups of the horizontal pixels and compares the accumulated brightness index value in each of the groups of the horizontal pixels adjacent to one another in the vertical direction, and determines a vertical coordinate position of the peak position based on a pixel position of a portion of the sensed projected image in which the groups of the horizontal pixels adjacent one another in the vertical direction have the same accumulated brightness index value.

3. The image processing system as claimed in claim 2,  
wherein the brightness index value is a luminance value, and  
wherein the brightness-index-value-distribution analyzing means determines the horizontal coordinate position of the peak position based on a pixel position at which a rate of change in a total luminance value in each of the groups of the vertical pixels adjacent to one another in the horizontal direction is equal to one, and determines the vertical coordinate position of the peak position based on a pixel position at which a rate of change in a total luminance value in each of the groups of the horizontal pixels adjacent to one another in the vertical direction is equal to one.

4. The image processing system as claimed in claim 1,  
wherein the image projection means projects a black-colored image and a white-colored image,  
wherein the sensing means generates the sensing information for the

black-colored image and the sensing information for the white-colored image, and

wherein the brightness-index-value-distribution analyzing means generates the sensing information from which influence of ambient light is eliminated based on a difference between the sensing information of the black-colored image and the sensing  
5 information of the white-colored image, and detects the peak position based on the generated sensing information.

5. An image processing system comprising:

a correction section which corrects image signals to adjust a distortion of an  
10 image;

an image projection section which projects an image based on the image signals;

a sensing section which senses the projected image to generate sensing  
information;

a brightness-index-value-distribution analyzing section which partitions the  
15 sensed projected image by predetermined image processing units based on the sensing information, detects a portion of the sensed projected image that includes a image processing unit having a maximum brightness index value among all of the image processing units as a peak position or detects part of a portion of the sensed projected image in which the image processing units adjacent to one another have the same  
20 brightness index values, and generates coordinate information which indicates the peak position; and

a correction-amount derivation section which determines the distortion in the projected image based on the coordinate information, and derives an amount of correction for the correction section according to a state of the distortion in the projected image,

25 wherein the correction section corrects the image signals based on the amount of correction.

6. A projector comprising:

correction means for correcting image signals to adjust a distortion of an image;

image projection means for projecting an image based on the image signals;

sensing means for sensing the projected image to generate sensing information;

5 brightness-index-value-distribution analyzing means for partitioning the sensed projected image by predetermined image processing units based on the sensing information, detecting a portion of the sensed projected image that includes a image processing unit having a maximum brightness index value among all of the image processing units as a peak position or detecting part of a portion of the sensed projected  
10 image in which the image processing units adjacent to one another have the same brightness index values, and generating coordinate information which indicates the peak position; and

correction-amount derivation means for determining the distortion in the projected image based on the coordinate information and for deriving an amount of  
15 correction for the correction means according to a state of the distortion in the projected image,

wherein the correction means corrects the image signals based on the amount of correction.

20 7. A projector comprising:

a correction section which corrects image signals to adjust a distortion of an image;

an image projection section which projects an image based on the image signals;

a sensing section which senses the projected image to generate sensing  
25 information;

a brightness-index-value-distribution analyzing section which partitions the sensed projected image by predetermined image processing units based on the sensing

information, detects a portion of the sensed projected image that includes a image processing unit having a maximum brightness index value among all of the image processing units as a peak position or detects part of a portion of the sensed projected image in which the image processing units adjacent to one another have the same brightness index values, and generates coordinate information which indicates the peak position; and

a correction-amount derivation section which determines the distortion in the projected image based on the coordinate information, and derives an amount of correction for the correction section according to a state of the distortion in the projected image,

wherein the correction section corrects the image signals based on the amount of correction.

8. A computer-readable program for causing a computer to function as:  
correction means for correcting image signals to adjust a distortion of an image;  
image projection means for projecting an image based on the image signals;  
sensing means for sensing the projected image to generate sensing information;  
brightness-index-value-distribution analyzing means for partitioning the sensed projected image by predetermined image processing units based on the sensing information, detecting a portion of the sensed projected image that includes a image processing unit having a maximum brightness index value among all of the image processing units as a peak position or detecting part of a portion of the sensed projected image in which the image processing units adjacent to one another have the same brightness index values, and generating coordinate information which indicates the peak position; and

correction-amount derivation means for determining the distortion in the projected image based on the coordinate information and for deriving an amount of correction for the correction means according to a state of the distortion in the projected

image,

wherein the correction means corrects the image signals based on the amount of correction.

5           9.       An information storage medium storing a computer-readable program, the program causing a computer to function as:

correction means for correcting image signals to adjust a distortion of an image;

image projection means for projecting an image based on the image signals;

sensing means for sensing the projected image to generate sensing information;

10       brightness-index-value-distribution analyzing means for partitioning the sensed projected image by predetermined image processing units based on the sensing information, detecting a portion of the sensed projected image that includes a image processing unit having a maximum brightness index value among all of the image processing units as a peak position or detecting part of a portion of the sensed projected  
15       image in which the image processing units adjacent to one another have the same brightness index values, and generating coordinate information which indicates the peak position; and

correction-amount derivation means for determining the distortion in the projected image based on the coordinate information and for deriving an amount of  
20       correction for the correction means according to a state of the distortion in the projected image,

wherein the correction means corrects the image signals based on the amount of correction.

25       10.       An image processing method comprising:

projecting a monochrome image onto a predetermined area;

sensing the projected image to generate sensing information;

partitioning the sensed projected image by predetermined image processing units based on the sensing information, and detecting a portion of the sensed projected image that includes a image processing unit having a maximum brightness index value among all of the image processing units as a peak position or detecting part of a portion of the sensed projected image in which the image processing units adjacent to one another have the same brightness index values;

generating coordinate information which indicates the peak position;

determining a distortion in the projected image based on the coordinate information, and deriving an amount of correction for correcting image signals so that the distortion in the projected image is eliminated according to a state of the distortion in the projected image; and

correcting the image signals based on the amount of correction.

11. The image processing method as claimed in claim 10,

wherein the image processing units include vertical pixels and horizontal pixels, the vertical pixels being pixels arranged in a vertical direction in the sensed projected image and the horizontal pixels being pixels arranged in a horizontal direction in the sensed projected image, and

wherein the method further includes:

computing an accumulated brightness index value for each of groups of the vertical pixels, and comparing the accumulated brightness index value in each of the groups of the vertical pixels adjacent to one another in the horizontal direction;

determining a horizontal coordinate position of the peak position based on a pixel position of a portion of the sensed projected image in which the groups of the vertical pixels adjacent one another in the horizontal direction have the same accumulated brightness index value;

computing an accumulated brightness index value for each of groups of the

horizontal pixels, and comparing the accumulated brightness index value in each of the groups of the horizontal pixels adjacent to one another in the vertical direction; and

determining a vertical coordinate position of the peak position based on a pixel position of a portion of the sensed projected image in which the groups of the horizontal pixels adjacent one another in the vertical direction have the same accumulated brightness index value.

12. The image processing method as claimed in claim 11,  
wherein the brightness index value is a luminance value, and  
wherein the method further includes:

determining the horizontal coordinate position of the peak position based on a pixel position at which a rate of change in a total luminance value in each of the groups of the vertical pixels adjacent to one another in the horizontal direction is equal to one; and

determining the vertical coordinate position of the peak position based on a pixel position at which a rate of change in a total luminance value in each of the groups of the horizontal pixels adjacent to one another in the vertical direction is equal to one.

13. The image processing method as claimed in claim 10, further comprising:

generating sensing information from which influence of ambient light is eliminated; and

detecting the peak position based on the generated sensing information.